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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,080	01/16/2004	Gennadi Finkelshtain	P24757	5279

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EXAMINER	
ECHELMAYER, ALIX ELIZABETH	

ART UNIT	PAPER NUMBER
1745	

NOTIFICATION DATE	DELIVERY MODE
08/24/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.		Applicant(s)	
	10/758,080		FINKELSHTAIN ET AL.	
	Examiner		Art Unit	
	Alix Elizabeth Echelmeyer		1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-102 is/are pending in the application.
- 4a) Of the above claim(s) 30-68 and 70-102 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-29, 69 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/17/04, 1/11/06, 1/12/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of the restriction requirement in the reply filed on June 5, 2007 is acknowledged. The traversal is on the ground that there is no serious burden on the examiner to search the two groups. This is not found persuasive because the groups are classified in different classes. Additionally, the groups do not significantly overlap as asserted by Applicant. The inventive component of Group I is a fuel cell using a membrane, while the inventive component of Group II is a membrane. As for the species in Group I, claims 70-102 do not recite a membrane, but are drawn to a means for providing hydrogen to a fuel cell from a metal hydride. As discussed below, the claims of Species I of Group I do not require a metal-hydride fuel cell.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 30-68 and 70-102 are withdrawn. Claims 1-29 and 69 are pending and are rejected for the reasons given below.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include reference numbers mentioned in the description, but instead include letters. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each

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drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Interpretation

4. It is noted a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). In claim 1, the intended use of a fuel cell with a hydride-based fuel is not given patentable weight. MPEP 2111.02.

5. The product-by-process limitations of claims 15 and 27-29 are not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art product is made by a different process (see *In re Thorpe*, 227 USPQ 964, (CAFC 1985), *In re Brown*, 173 USPQ 685 (CCPA 1972), and *In re Marosi*, 218 USPQ 289, 292-293 (CAFC 1983)). MPEP 2113.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 2 and 69 rejected under 35 U.S.C. 102(e) as being anticipated by Kamo et al. (US 2003/0059660).

Kamo et al. teach a fuel cell having vent holes on the outer container (abstract).

The vent holes of Kamo et al. allow for the escape of gas formed during the operation of the fuel cell. The vent is impermeable to liquid. (Figure 4A, [0049]).

The vent holes contain a porous gas/liquid separation membrane that is permeable to gas but impermeable to liquid ([0050]).

As for claim 2, the membrane is made of polytetrafluoroethylene, which is hydrophobic ([0125]).

Claim Rejections - 35 USC § 102/103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 3-5, 7 and 15 are rejected under 35 U.S.C. 102(e)/103(a) as being unpatentable over Kamo et al.

The teachings of Kamo et al. as discussed above are incorporated herein.

Kamo et al. teach a porous gas/liquid separation membrane that allows the passage of gas but not liquid.

As for claims 5 and 7, the membrane of Kamo et al. is made from the same material as the membrane of the instant invention, polytetrafluoroethylene.

As discussed above, the product by process limitations of claim 15 are not given patentable weight.

Since the membrane Kamo et al. is made of the same material and serves the same purpose as the instant membrane, one of ordinary skill in the art would recognize that the membrane of Kamo et al. would inherently have the same porosity and thickness as the instant membrane, since those limitations would be required for the membrane to function in the same way.

Alternatively, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the porous membrane of Kamo et al. with sufficient thickness and porosity to serve the function required, specifically to allow for the passage of gas but restrict the passage of liquid.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamo et al. in view of Kasai et al. (US 5,112,941).

The teachings of Kamo et al. as discussed above are incorporated herein.

Kamo et al. teach a fuel cell having a membrane that is gas permeable and liquid impermeable but fail to teach that the membrane is made of a fluorine-containing polyolefin.

Kasai et al. teach a separation membrane that has extremely high selectivity and gas permeability for use as a membrane for separation of gas or liquid mixtures (abstract).

The membrane of Kasai et al. is made of a polyolefin porous membrane treated with fluorine (column 1 lines 48-49).

The membrane of Kasai et al. has good durability and high hydrogen permeability (column 1 lines 60-61, 67-68, column 2 lines 1-2).

It would be desirable to use the membrane of Kasai et al. as the porous membrane of Kamo et al. because it is durable and has high hydrogen permeability.

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Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the membrane of Kasai et al. as the porous membrane of Kamo et al. because it is durable and has high hydrogen permeability.

12. Claims 8, 9 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamo et al. as applied to claim 5 above, and further in view of Mehl et al. (US 3,911,080).

The teachings of Kamo et al. as discussed above are incorporated herein.

Kamo et al. teach a porous gas/liquid separation membrane for a fuel cell but fail to teach an inorganic component such as activated carbon in the membrane.

Mehl et al. teach a liquid-impermeable gas-permeable membrane (abstract).

Mehl et al. further teach the addition to the membrane of an inorganic powder for absorbing pollutants in the gas that passes through the membrane (column 3 lines 26-40).

The powder may be alumina, and is preferably activated carbon in a polytetrafluoroethylene matrix (column 3 lines 32-33, 39-40).

As for claims 18 and 19, since the membrane Kamo et al. in view of Mehl et al. is made of the same material and serves the same purpose as the instant membrane, one of ordinary skill in the art would recognize that the membrane of Kamo et al. in view of Mehl et al. would inherently have the same porosity and thickness as the instant membrane, since those limitations would be required for the membrane to function in the same way. Alternatively, it would have been obvious to one having ordinary skill in

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the art at the time the invention was made to make the porous membrane of Kamo et al. in view of Mehl et al. with sufficient thickness and porosity to serve the function required, specifically to allow for the passage of gas but restrict the passage of liquid.

13. Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamo et al. in view of Kasai et al. as applied to claim 6 above, and further in view of Witzko et al. (US 5,586,246).

The teachings of Kamo et al. and Kasai et al. as discussed above are incorporated herein.

Kamo et al. in view of Kasai et al. teach a fuel cell having a membrane comprising a fluorine-containing polyolefin but fail to teach a coating on the membrane.

Witzko et al. teach a thin film hydrophobic polymer membrane with a surface coating (abstract, column 1- lines 27-34).

The coating of Witzko et al. is made of a perfluorocarboxylic acid having the formula $\text{CF}_3(\text{CF}_2)_n\text{--}$, where $n > 6$ (column 2 lines 40-44).

Regarding claim 10, since the membrane and coating meet the limitations required for the instant invention, the coating would inherently have lower surface energy than the porous membrane.

As for claim 11, when $n=7$, the group contains 17 fluorine atoms.

With regard to claims 12-14, when $n=7$, the group contains 8 carbon atoms.

Witzko et al. further teach that the coating provides good chemical and mechanical stability and a permanent finish (column 2 lines 11-15).

It would be advantageous to use the coating of Witzko et al. on the membrane of Kamo et al. in view of Kasai et al. since the coating provides good chemical and mechanical stability and a permanent finish.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to the coating provides good chemical and mechanical stability and a permanent finish.

14. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamo et al. as applied to claim 1 above, and further in view of Sakata et al. (US 4,583,996).

Kamo et al. teach a membrane for gas/liquid separation in a fuel cell but fail to teach an inorganic membrane comprising borosilicate.

Sakata et al. teach a semipermeable membrane for separation of gas (abstract).

Sakata et al. further teach that borosilicate glass is preferably used as the membrane material (column 5 lines 1-2).

Borosilicate glass is selected because it forms a soft phase when heat treated that, when exposed to acid, is leached to form pores (column 4 lines 58-63).

It would be desirable to use borosilicate glass to form the membrane of Kamo et al. since it can be formed into a porous gas permeable membrane.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use borosilicate glass to form the membrane of Kamo et al. since it can be formed into a porous gas permeable membrane.

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15. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamo et al. in view of Mehl et al. as applied to claim 17 above, and further in view of Welker (US 2004/0083891).

The teachings of Kamo et al. and Mehl et al. as discussed above are incorporated herein.

Kamo et al. in view of Mehl et al. teach a porous gas permeable membrane but fail to teach that the membrane comprises stainless steel.

Welker teaches a liquid separator membrane having a porous stainless steel support ([0010]).

It would be desirable to provide a support, such as the stainless steel one of Welker, to the membrane of Kamo et al. in view of Mehl et al. in order to protect the membrane from the volatile conditions in a fuel cell.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a support, such as the stainless steel one of Welker, to the membrane of Kamo et al. in view of Mehl et al. in order to protect the membrane from the volatile conditions in a fuel cell.

16. Claims 22-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamo et al. in view of Mehl et al. as applied to claim 16 above, and further in view of Witzko et al.

The teachings of Kamo et al., Mehl et al. and Witzko et al. as discussed above are incorporated herein.

Kamo et al. in view of Mehl et al. teach a fuel cell having a membrane comprising an inorganic component such as alumina but fail to teach a coating on the membrane.

Witzko et al. teach a thin film hydrophobic polymer membrane with a surface coating (abstract, column 1- lines 27-34).

The coating of Witzko et al. is made of a perfluorocarboxylic acid having the formula $\text{CF}_3(\text{CF}_2)_n-$, where $n > 6$ (column 2 lines 40-44).

As for claim 23, when $n=7$, the group contains 17 fluorine atoms.

With regard to claims 24-26, when $n=7$, the group contains 8 carbon atoms.

As for claims 27-29, the product by process limitations of these claims are not given patentable weight, as discussed above.

Witzko et al. further teach that the coating provides good chemical and mechanical stability and a permanent finish (column 2 lines 11-15).

It would be advantageous to use the coating of Witzko et al. on the membrane of Kamo et al. in view of Mehl et al. since the coating provides good chemical and mechanical stability and a permanent finish.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to the coating provides good chemical and mechanical stability and a permanent finish.

With regard to claim 22, it would have been obvious to one having ordinary skill in the art at the time the invention was made to place the coating on the inner side of the membrane to provide protection against the volatile conditions known to exist in a fuel cell.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alix Elizabeth Echelmeyer
Examiner
Art Unit 1745

aee


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